AGRICULTURAL BOTANY FOR EXTENSIONISTS.

An Elementary Text-Book on Agricultural Botany. By M. C. Potter, M.A. Small 8vo. Pp. 250, with ninety-nine illustrations in the text. (London: Methuen and Co., 1893.)

THIS is a very good little book up to a certain point, but it is neither better nor worse than the general run of elementary works on botany, in which there is an attempt to cover the whole field. The physiological and anatomical parts are the best; yet we see no reason why the title should be "Agricultural Botany." Indeed, we fear the author has been a little too ambitious; laudably ambitious, perhaps, though wanting the practical knowledge necessary to achieve his object—not that it is one within easy reach. This is an extract from his preface: "My aim in these few pages has been to lay a foundation which may serve to guide the future operations in the field, and form a basis for intelligent trial and experiment. In these days of competition and struggle for existence, every little tells, and the farmer who, understanding, can apply his knowledge, is more likely to succeed than one who labours without the advantage of this knowledge."

No doubt a man would not necessarily be a worse farmer because he possessed some knowledge of vegetable physiology, nutrition, or even classification, and he might possibly derive a more intelligent enjoyment—if there be any left—from his occupation; but if he knew all the botany in Mr. Potter's book, and all that is not in his book, we doubt whether he would be any nearer making farming pay, which is the main object, after all, of the majority of those who engage in the pursuit. Success in farming does not depend so much on scientific knowledge as on practical knowledge. Science has doubtless done much to advance farming—especially mechanical science; and we should be the last to discourage making botany a subject of study for the budding farmer. But we think the macroscopic side is too much neglected in favour of the microscopic side. For instance, we sought the distinctions between rye (*Secale*) and barley (*Hordeum*); but although the anatomical structure of the stem of the former is described and illustrated in some detail, it is not included in the chapter on grasses where the floral structure is described. In the description of the natural order Leguminosæ, it is stated that the fruit is always composed of a single carple; that the leaves are never opposite; and that the seeds are always destitute of endosperm. It is unnecessary to give examples disproving these statements. On the next page the flowers of the sub-order Cœsalpinæe (*sic*) are said to resemble the Papilionaceæ, but to differ in having the standard inside the wings. There is one element of truth in this. The nature and extent of the information given under some of the genera of Leguminosæ may be gathered from the following: *Sarothamnus*—the broom is common on sandy waste lands. *Ononis*—a small plant with pink flower, commonly known as the rest harrow. There are two species, one with spines and one without. Looking under *Pisum*, we discover that *P. arvense*, the field pea, is not mentioned. Under *Vicia*, the tare, *V. sativa*, is described as having a weak stem, partly erect, and purple flowers, often in pairs; with the further information that it is often cultivated. In short, this part of the book needs thorough revision before it can be considered as useful or satisfactory. At half a dozen other places where we opened the pages, we noticed the same incompleteness and want of precision.

THE PRINCIPLES OF HOSPITAL CONSTRUCTION.

Healthy Hospitals: Observations on some Points connected with Hospital Construction. By Sir Douglas Galton, K.C.B., F.R.S., &c. (Oxford: The Clarendon Press.)

THE object of this book, as its author, Sir Douglas Galton, tells us, is to bring together the principles of hospital construction which now lie scattered through various publications, and to show what points are essential to health in hospital establishments. This task has been admirably fulfilled by the author, and we cannot but recognise the skilful manner in which from chaos he has brought together and condensed in the small compass of 282 pages such a vast amount of useful information.

Sir Douglas Galton has already a high reputation for the application of scientific methods to the construction of barracks and hospitals. Few men have had larger opportunities of acquiring such knowledge in the public service, and very few have been able to investigate the questions involved so thoroughly as the author of "Healthy Hospitals," whose zeal has induced him to visit every place, as well in America as on the continent, where he could obtain sound practical knowledge on the subject by personal observation and inquiry. We therefore gladly welcome this book, which is the outcome of his great experience.

In the preliminary chapter Sir Douglas Galton enters very briefly into the historical part of his subject, and dates the great improvement in the construction of hospitals from the close of the Crimean War, the American War of Secession, and the Franco-German War of 1870–71.

He subsequently lays down the first principles on which the successful treatment of disease depends, the selection of site, the conditions of air supply, of warming, lighting, and water supply. Many of the rules laid down are of course not new, but they are nevertheless valuable, and bear to be repeated and emphasised.

The rules to be followed are defined so clearly and concisely, that it becomes a simple matter to apply them in a practical form. The chapter on site is one that will at a glance show the importance of the subject, and at the same time the difficulties it often has to contend with. Many errors are pointed out which have been committed in the selection of plans for some of the large hospitals in England and on the continent. This is one of the most important and best chapters in the work before us.

In the chapters on the constitution and movements of the air, and on ventilation and warming, which are dependent in a great degree on these changes, the author enters very fully into the consideration of these important subjects. He accepts De Chaumont's standard as the best guarantee for keeping an air space pure and wholesome—a point of no small importance, since latterly a lower standard has been advocated. He recognises the importance of investigating the micro-organisms in air, but states "that our knowledge of this science and of the nature of the organisms is too recent to allow us to lay down any fixed rules for judging of what are dangerous characteristics of air in wards measured by this standard." This is no doubt true up to a certain point, but the Ratio $\frac{\text{Bacteria}}{\text{Moulds}}$ as pointed out by Carnelly and Haldane (*Philosophical Transactions of the Royal Society*, 1887), should not be overlooked in investigations on this point.

The chapters on warming and lighting are complete monographs on these subjects, as we might expect from the distinguished author who has made them his special study.

In discussing the various methods of ventilation which have been applied to hospitals, is mentioned the mechanical extraction of air as practised by propulsion. This plan has never found favour in England, but has been introduced into some continental hospitals. We note that on several occasions when three of the most important hospitals were visited in Europe and the United States, in which ventilation depended on propulsion, on every occasion the propulsion happened to be out of use for the time; in some cases evidently with the object of saving the expense of fuel!

The latter chapters are devoted to the consideration of the ward unit and the administration buildings. Every detail has been most carefully noted, and the closest criticism fails to find an omission. The rules are laid down with a simplicity and clearness which render it very difficult to notice them without quoting them in detail, and the plans which accompany the letter-press show at a glance the principles which should be followed.

We regret that the writer has not entered more fully into the question connected with isolation hospitals for infectious diseases. No plan is given of any such hospital, although mention is made of the Local Government Board rules for the London fever hospitals.

The isolation pavilion of the Johns Hopkins' Hospital seems to be so admirably constructed, and the structural details so carefully carried out, that the plan would be a valuable addition to the present work. In infectious hospitals, the position of the administration block to the wards would also differ to the plan usually adopted for general hospitals.

Sir Douglas Galton is opposed to the expense which some of the costly and palatial hospitals of the present day have entailed, and advocates simplicity of design and economy in construction as leading conditions to be observed in building hospitals for the future. If the rules he has so clearly given throughout his work be attended to, these important qualities will naturally follow.

We commend this book not only to the architect and sanitarian, but to all interested in hospital work. It is eminently practical, and its author must be congratulated on the completion of a work of no ordinary merit, and one which is a fitting companion volume to his "Healthy Homes.'

OUR BOOK SHELF.

The Vault of Heaven. By Richard A. Gregory, F.R.A.S. (London: Methuen and Co., 1893.)

THE aim of this volume of the University Extension Series of text-books is to give "an elementary account of some of the marvels that have been revealed by the use of the telescope and two of its most indispensable adjuncts,—the spectroscope and the photographic camera." In the space of about 180 pages the author contrives to give an admirable introduction to the study of modern physical astronomy, and the whole is set forth in a manner calculated to awaken a permanent interest in this most fascinating subject. The book is eminently readable, and contains none of the mathematical expressions which are so liable to arrest the progress of the general reader. Astronomical telescopes, including equatorials and meridian instruments, form the subject of the first chapter. Then follow two chapters giving an excellent account of the sun and of the various methods by which our knowledge of that luminary has been gradually accumulated. The reader is next presented with bright and brief pictures of the moon and planets, comets and shooting-stars, and of the various bodies which are met with as we proceed further outwards into "boundless space." The "Chemistry of Stars and Nebulæ," and "Celestial Photography," define the scope of the final chapters. Many novel illustrations are given to assist the reader in comprehending the significance of astronomical data. The subject-matter is quite up-to-date, and in matters not yet quite clear the author has wisely refrained from taking sides in controversies. The historical references are fairly complete, and space is found for some most interesting extracts and diagrams from Galileo's "Sidereal Messenger," published in 1610.

Where all the various parts of the subject are so well explained, it is difficult to single out points for special mention, but we may say that the author is particularly successful in his treatment of celestial photography, though we cannot help regretting that more is not said about the immense gain to astronomy which has followed from the application of photography to the study of the spectra of the heavenly bodies. We are glad to see, however, that he says (p. 33) with regard to the Carrington-Hodgson observation of 1859, "the statement that the outburst was *immediately* followed by a magnetic storm does not appear to be founded on fact. From an examination of the magnetic records kept at Kew, it appears that at the time of the observation the needles were unaffected, and it was not until *fifteen hours* after that a magnetic storm occurred."

A word of praise is due to the author for the careful preparation and selection of diagrams and photographs, all of which are excellently reproduced; many of them make their first appearance in this volume. There are a few misprints—as, for instance, on p. 113, where 14 times 60,000 is given as 84,000; but they are not so serious as to be misleading. A classified list of astronomical books for the use of those desiring to extend their reading beyond the limits of an introductory textbook, concludes a volume which is well adapted to impart the preliminary knowledge essential for a proper understanding and appreciation of the fresh results which are constantly being obtained in the various observatories throughout the world.

A Journey through the Yemen, and some General Remarks upon that Country. By Walter B. Harris, F.R.G.S. (Edinburgh and London: William Blackwood and Sons, 1893.)

THE Yemen is an indefinite tract stretching inland from the south-western corner of Arabia, and the "general remarks" upon its geography and history are placed first in this volume, the personal narrative of the author's